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ABSTRACT

The University of Wisconsin Extension has developed the technology and programing to deliver noncredit educational broadcasts via telephone to professional audiences in remote locations throughout the state. Research has shown two-way audio to be an effective educational medium, permitting feedback, discussion, resource sharing, and the sharing of instructors. The technique is most effective when delivered in 20 to 25 minute lectures and augmented by printed materials, audiovisual aids, and home visits. Initiating rapport and maintaining attention are problems, but they can be overcome by: (1) using a personalized approach; (2) employing varied teaching styles; and (3) evaluating the appropriateness of the mode of instruction. (EMH)

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HUMANIZING TELEPHONE BASED INSTRUCTIONAL PROGRAMS

BY

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The telephone, like an old shoe, is so familiar, utilitarian and time-worn, that it's often taken for granted. For this reason, perhaps Ma Bell's extraordinary artifact gets limited play in the literature of instructional technology. How can something as "unadulterated" as an old shoe compete with the pizazz of video, computers and satellites?

Although the telephone is a mainstay of our personal and professional communication, it continues to be overlooked as an effective educational medium. During the past 20 years, its use for learning has been limited in favor of more glamourous media. Thus the telephone remains a virtually untapped natural resource for education.

WISCONSIN'S EDUCATIONAL TELEPHONE NETWORK

The University of Wisconsin has a long tradition of tapping educational resources to reach people in their home communities. In the 1900's, then UW President Charles Van Hise charged Wisconsin educators to extend the boundaries of the campus to the boundaries of the state. One technique developed to extend UW resources was WHA Radio--the first radio station in the United States. An outgrowth of radio, the telephone, too, was pressed into development and use in Wisconsin for statewide educational programming.

It is not the intent here to reiterate the Wisconsin Educational Telephone Network (ETN). It has already been fully described in other papers--Zimmerman, 1970, and Parker, 1974, 1973, 1972, 1970 and 1969. Although this paper will include a brief explanation and description of the Wisconsin system, the major thrust here will be to discuss some of the important personalizing, discussion and teaching techniques that are built into the design of long distance ETN programs.

TELEPHONE NETWORK DEVELOPMENT MEETS NEEDS FOR MEDICAL EDUCATION

A telephone network was born in Wisconsin in 1965 to meet the continuing education needs of medical doctors in all corners of the state. ETN, as it is known in Wisconsin, is a 4-wire dedicated telephone network that takes the form of a huge party line.

The two-way audio medium reaches into ETN learning centers in courthouses, extension offices, University of Wisconsin campuses and centers, libraries and hospitals in each of the state's 72 counties. In all, University of Wisconsin Extension faculty can reach in to 120 different Wisconsin communities via ETN to more than 200 specific sites. More than 25,000 enrolled in programs during 1974-75.

ETN STATION EQUIPMENT

The vehicle that links all ETN students into one large Wisconsin classroom is a new communications unit called the Edu-Com II. Developed by Darome, Inc., Harvard, Illinois, in conjunction with the University of Wisconsin and the Wisconsin Telephone Company, it is a portable, self-contained unit consisting of a large speaker and four microphones. The unit plugs into a standard telephone jack and AC power outlet. All ETN classrooms have identical equipment and no technical skill or special knowledge is required to operate it.

Instructors may originate programs from any statewide ETN classroom or from the ETN studios in Old Radio Hall on the University of Wisconsin-Madison campus. Participants at any ETN location simply depress and hold a bar on the base of one of the microphones to speak with the instructor or any other ETN student in the state.

The Darome Edu-Com units were designed for groups of up to 200. In cases when an ETN classroom group is this large, the units have a built-in public address unit for easy hearing at that particular site.

ETN PROGRAMMING

From the 18 locations participating in the first ETN program, the system has expanded both in listening locations and program diversification. In addition to the original medical sessions, programs are now offered in pharmacy, English, law, social work, library science, education, nursing, agriculture, engineering, economics, business, and the arts. And, the list goes on and on.

Most ETN programs are non-credit continuing education for professional adults, although some credit courses are offered each semester. Programs vary from one to three hours in length and include a variety of program formats.

In addition to course offerings, the network is also used in other ways. Messages from the University Extension office in Madison are relayed each morning to statewide Extension faculty, followed by agents, in turn, forwarding messages to the Madison office. County faculty also confer with each other via ETN each morning either by prior arrangement or by spontaneous quiry.

County staff meet via ETN each Monday morning for a statewide faculty meeting, and other statewide departmental meetings are also regularly scheduled on ETN. Emergency agricultural information concerning early Wisconsin frosts and corn blight disease, for example, is also disseminated to agents around the state via ETN.

THE COST OF THE ETN SYSTEM

Educational programming on the ETN system is an important activity of many University of Wisconsin-

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Extension departments. And, the cost is minimal. Although Extension faculty use the network time without charge, the cost per instructional hour for ETN non-credit programs averages about 14 cents per student contact hour. This cost reflects only the telephone system rental, payment of station equipment and its operation, and not course instructional materials or an instructor's time. The cost is determined by the total operating budget for Instructional Communications Systems, the unit administratively responsible for the ETN system.

TEACHING EFFECTIVENESS VIA THE TELEPHONE

In the past ten years several studies have analyzed the effects of student learning via amplified telephone systems. These systems are referred to as tele-lectures or Educational Telephone Network (ETN). The research on teaching via the telephone is rather extensive. The literature (seems to) support the view that with proper design of program materials, the telephone is an effective inexpensive educational communication channel.

Most of the investigations on tele-lecture have centered around the comparison of face-to-face lectures to remote tele-lectures. Studies include all types of subject matter: graduate courses, Hartje (1973); undergrad credit, Hoyt & Frye (1972), Zimmerman (1970); teacher education extension courses, Blackwood & Trent (1968), Pellett (1970); formalized adult instruction at their place of business with the instructor rotating his appearances among the location, Gold (1973); art education to small schools in 4 western states receiving simultaneous instruction from a central source with the aid of overhead transparencies, Jesser and Clarke (1966).

As early as 1963 Beattie and Frick reported high school history was taught by a college professor lecturing in American History (via tele-lecture system).

All the studies indicated that the telephone classes compared to face-to-face classes were equally successful, or that the telephone was found to be a useful educational communication system capable of being used for effective educational experiences.

Feedback--Discussion

Etzioni (1972) indicates a real strength of the telephone for education as it provides a mechanism for real-time dialogue between geographically dispersed groups and continuous feedback between students and instructor.

Sharing Resources

In a time when most educators are looking for quality educational resources at the lowest possible cost, Perraton (1969) indicates that a telephone lecture network can provide a vehicle for universities to share information and instructors. An Adult Basic Education course was taught by Dr. Burton Kreitlow on the Wisconsin ETN and expanded to include students at the Tuskegee Institute.

Effect Use of Tele-lectures

Puzzuoli (1970) suggests that tele-lecture teaching is more effective when the professor limits continuous lecturing to 20-25 minutes, provides printed material, uses audiovisual techniques as a supplement, makes a number of personal visits to the remote locations and bases the class on problem solving techniques.

LIMITATIONS OF NON-VISUAL TWO-WAY AUDIO TRANSMISSION

The two-way audio channel can be a highly effective means of reaching statewide clientele. Research on the teaching effectiveness of tele-lectures, combined with 10 years of ETN programming experiences in Wisconsin tells us that. The system has many other apparent strengths--it is a truly continuing education medium open for all; it is a time and economical money saver for those who instruct courses and for those who attend; it can reach entirely new audiences in the state; it can reach isolated professionals; and it can be a vehicle for universities and other institutions to share resources.

However, we also need to shift gears briefly and look at the other side--the inherent limitations of non-visual, two-way audio transmission. Subject matter specialists who use the ETN system need to not only understand the system and its capabilities, but also respect its limitations.

It's Hard Making a Dispersed Group A "Group"

One limitation of a system like ETN is that it's hard to make a geographically dispersed group a "group" and not just a collection of voices attached to strangers. It often takes extra instructor effort to create a current of group feeling and rapport when 165 people are scattered all around at some 50 different ETN locations, for example. But, it can be done.

Discussion Doesn't Just Happen

A second limitation of two-way audio transmission relates to the fact that adults like to be actively involved in the learning process. That desire for two-way communication between students and instructors and among students is the basic justification for ETN's existence. But ETN instructors often have to work to get discussion started and to continually reinforce it during the program.

People Don't Listen Very Long

A third limitation is tied to a general characteristic of all audiences, ETN and otherwise. That fact is that they don't listen for very long. Research studies verify what we know from experience. It's hard work concentrating on a solitary audio message for very long. For adults, that "very long" is not much more than 12 or 15 minutes.

Fortunately there are a variety of techniques that can be used to improve a two-way audio program's listenability and to stop mind-drift. Many of these techniques have been incorporated in adult education programs for many years, but there are unique adaptations when used with a statewide two-way audio

communications channel like ETN.

The limitations surrounding a non-visual two-way communications channel like ETN can be overcome. There are scores of techniques to humanize the ETN learning experience, to stimulate statewide discussion and to make programs lively and interesting.

The question of "How do I personalize this kind of learning experience for my students?", and "How do I get discussion going?" are among the first concerns expressed by new ETN programmers. That's why we're going to describe some of these techniques first.

Because by nature of their professions, ETN instructors are already subject specialists. Program formats for their content area and anticipated clientele may not change significantly from a face-to-face situation to an ETN program. We have however, a dozen formats that have been used successfully and repeatedly by many.

As with all three major techniques suggested here, ETN instructors are only limited by individual imagination and creativity.

PERSONALIZING THE ETN EXPERIENCE FOR STUDENTS

A system like ETN will be a new, very different way of learning for some students. It is a new medium, and the technology of it will frighten some; it may seem a face-less kind of cold and non personal environment. Instructors however, can employ several techniques to make the ETN experience highly personal. Here are some:

Send Students Welcome Letter

Once a student has registered and before the first class session, many instructors send their students a "welcome aboard" letter. In it the instructor explains about the ETN system and what the course has in it for the individual. A first assignment can also be made in this letter to get the students involved right away.

Include Instructor/Guest Instructors Picture

ETN students are curious about their instructors and each other. ETN lecturers often include a picture of themselves and brief bibliography either in the course brochure or in the first program's handout materials. Occasionally ETN programs with a limited number of sites have asked students to send a slide of themselves or the group at their site to the instructor so it can be duplicated and sent to all sites. In programs devoted to individual or group reporting, the combination of a person's voice and picture can be a personalizing experience for all learners.

Distribute Class Roster to Everyone

Just as students like to know something about their ETN instructor, they're also curious about other students. A class roster distributed to all students can accomplish this. On the roster, students may be separated by ETN location, with a brief description of educational and/or professional experiences, address, telephone number, etc.

Call Students by Name

Most people like to be recognized by their name. When ETN students ask questions or make comments, instructors may ask them to first identify themselves and their location. This helps both the instructor and the students around the state identify a name with a voice. Referring to a student's professional experience, for example, is another way to personalize the ETN learning environment.

Assign Reports

Student reporting on the network has many values. It's an excellent device to personalize the ETN experience for the student, particularly if the student draws upon his or her own personal or professional experiences.

Establish Additional Communications Channels

An ETN-O-Gram, simply a half sheet of paper, was a regular invitation to one ETN class to make comments or ask questions that didn't fit into an ETN program's question and answer period. Other instructors continually urge their students to write or call them if they have questions after an ETN program.

Visit ETN Sites Around the State

Many ETN instructors try to visit some of the ETN locations in the state during a program series. Students at other nearby ETN locations may then try to travel to a designated location when the instructor visits there. At this time, ETN instructors may also visit their students in their work situations before class and stay for an hour or two after the ETN program to further get to know a local class better.

Schedule Face-to-Face Group Conferences

ETN instructors have also arranged one day face-to-face conferences in the middle of or at the conclusion of an ETN program series. For ease in student traveling, these conferences can be split among the northern and southern participants, or held in conjunction with other conferences, such as the Wisconsin Teachers Education conference. Such gatherings allow participants to meet each other and to take part in learning activities that may not be feasible on ETN.

Let Personality Come Through Network

Finally in a non-visual communications channel like ETN, it's important for instructors and students to let their personalities come through the microphones. ETN students can hear the laughter in each

other's voices and they do know, for example, whether or not a person is enthusiastic by the way they come across on the microphone. When people smile, for example, their voice also reflects it. If instructors are sitting alone in the ETN studio, they may feel their gestures and facial expression are ridiculous, but they're not. Any animation that makes a message more vital is just as important or more--in an ETN program as it is in the classroom.

STIMULATING STATEWIDE DISCUSSION ON THE ETN SYSTEM

The ETN system is unique, partly because it allows two-way communication and interaction among faculty and students in every Wisconsin county. Sometimes students seem more inclined to ask questions on the network than in a classroom situation. However, stimulating that interaction on a non-visual communications channel may be a challenge for some instructors. Instead of instant discussion during a question and answer period, instructors may for many reasons, find themselves greeted with dead silence. Some techniques used to make ETN programs truly two-way channels include:

Plant Questions

Planting questions among students is one technique to get discussion started. ETN programmers have primed a few enrollees in their programs before a series to ask questions if discussion starts off slow or lags. Also, moderators usually try to have several questions ready themselves.

Assign Feedback

Programmers can create situations to generate questions and discussion. Frequently this is done with course handouts. An instructor, for example, may ask several ETN locations to react to specified questions during the next ETN program. When that day's program is finished, an instructor knows that these students are going to work together on the assigned question. This technique helps a specific listening group become better acquainted and also helps build discussion into the next ETN session.

Relate Questions to Student's Occupation

ETN instructors can design discussion around student names and occupations. These facts may be taken from the course registration blank or from student identification cards completed at the first ETN program.

If an instructor talks about apprenticeship, for example, and he knows from his list that there are 5 to 6 people in his statewide ETN class who either work with an apprentice or who are associated with an apprenticeable occupation, then he can direct questions to some of those people. Frequently people are more comfortable talking about that which they're involved in day to day or that they've experienced. In addition to stimulating discussion, this technique also helps personalize the ETN experience for learners.

Initiate Weekly Quiz/Group Projects

Weekly quizzes completed by each ETN site or other kinds of group projects can stimulate both on-site and statewide discussion. Both permit learners to actively participate in face-to-face dialogue and also help keep program content relevant and practical for them. Instructors have found that a weekly group quiz at the beginning of class is an excellent stimulus for student discussion on the network.

Group to Group Discussions

Not all student questions and comments need to be channeled through the ETN instructor or moderator. ETN students at Green Bay, for example, talk directly to or question students at Superior or Darlington. Group projects can encourage ETN participants to share discussion among themselves. After hearing or reading a group project report from Green Bay, for example, the Superior group could evaluate the report on the network or further question them. Frequently other ETN sites join in the discussion and the moderator and instructor can "step back" and participate as a fellow learner.

Schedule Oral Assignments

Assignment reporting on the network is another built-in discussion device. Short reports of 5 to 10 minutes can easily be incorporated in ETN program formats. In addition to stimulating interest among fellow students, this technique helps trigger comments or reactions from other students.

TEACHING TECHNIQUES INCORPORATED INTO ETN PROGRAMS

There are many elements to a program. The ideas within it, or its content, are paramount. A second important element is the way in which these ideas are presented.

Instructors use a variety of "ways" to present ETN programs. Many of these approaches will be familiar to adult educators as they have been used for many years in continuing education settings. However, many have been adapted to fit the needs of telephone teaching. Others have arisen out of ETN programming experiences.

These formats include:

Lecture/Question and Answer

The lecture/question and answer format is popular on ETN among doctors, nurses and attorneys. They're to learning this way, and it's also an efficient method. Large numbers of facts, new information or review material can be presented in a short period of time.

On ETN, however, it's not just a lecture. The ETN lecture is reinforced in many ways by supplementing the oral material with written handouts. Prior to an ETN program, students receive skeleton outlines so that they can easily follow tele-lecture, and take

notes. Significant visual materials are usually incorporated into handouts. A study question list, bibliographies, additional reading sources, and perhaps an instructor's picture are among other visual material used to accompany and reinforce audio presentations.

Sufficient question and answer time is, however, needed so that there can be two-way communication. ETN students around the state need the opportunity to clarify speaker ideas, support or dispute material, or carry the discussion into personally relevant areas.

Celebrity Expertise

Well-known national and international authorities are frequent ETN guests. Guests of this caliber not only attract students to the program, but they also are rich teaching and learning resources and interest-holders. Guests can easily and inexpensively be connected to the statewide ETN network via long distance telephone lines. Main presentations may be given during the actual program, or prerecorded. In the later case, celebrities can be connected live for the question and answer period. Presentations by other resource people can also be handled in this same manner. All speakers should be provided with an ETN audience profile. Skeleton outlines or other handout material should reinforce guests presentations.

Student Reports

The peer teaching concept is an excellent ETN teaching technique. Example teaching, no matter what the subject area, helps bring programs down to earth and stimulates interest. The sharing of experiences, whether they be of a professional or personal nature, also personalizes the ETN learning experience for all.

Interview

Interviews of 15 to 20 minutes are meaningful segments of many ETN programs. An education instructor frequently asked his students what resource people they would like to hear and question during an ETN interview. During the program, the instructor interviews a guest with 5 to 8 questions that students have sent in. Following that segment, the network is "open up" so that students can carry the discussion into other areas.

Panel Discussion

If the topic is especially complex or controversial, panel discussions can create lively, informative ETN programs. Panelists may be located anywhere in the state or the country. In addition to the topic at hand, panelist's voices helps hold listener's attention. Panels should include no more than 4 members, however, as statewide participants need to be able to distinguish voices. And, as with any panel discussion, a moderator helps keep the topic in focus. Again, bibliographies and any other appropriate written materials should be sent to the ETN students prior to the program.

Reactor Panels

ETN reactor panels can improve program communication, particularly clarification of important points and ideas. Panelists represent the entire audience by reacting to an ETN speaker's presentation. To be successful, the speaker, panel members and the moderator should agree on program objectives and procedures before the actual ETN program.

Because of large ETN enrollments and limited program question and answer time, reactor panels can also efficiently cover common audience questions. Once these questions are covered, the ETN network is opened up for questioning by statewide participants This technique is also successful to stimulate student discussion.

Role Playing, Skits

Small group skits or playlets can stimulate ETN audience thinking and statewide discussion. An ETN program for social workers and foster parents in Wisconsin frequently uses short vignettes, to portray foster parent feelings. ETN participants can prerecord skits prior to the actual program or perform them during the program. Structured role playing, where the script and performance are carefully planned out prior to the presentation, work well on ETN. A suitable introduction and discussion following the skit are also needed to meet the intended objective.

Buzz Groups

ETN participants frequently split into buzz groups at their sites during ETN programs. Wisconsin Water Supply operators use approximately 30 minutes of their two hour ETN programs for local discussions. After the program's main ETN presentation, groups "break off" from the network to discuss how the day's topic related to local situation. This buzz group format gives participants another opportunity to actively participate in the program and also helps keep program content relevant and practical. Group leaders at each location serve as a resource person, thus alleviating the need to use limited ETN program time for common participant questions. Buzz sessions can also be used to formulate group questions, brainstorm a problem or develop a case study presentation or solution.

Case Study

Case studies of real problems are one way to bring discussions down to earth and to stimulate both local and statewide ETN discussion. Clergymen enrolled in the ETN program "Parish and Personal Conflict: Disaster or Opportunity" were encouraged to bring with them written case studies of conflict situations in which they were currently or had recently been involved. This data then became the agenda for each ETN location group consideration. Spokesmen at each site may also represent their group and report on how the group analyzed the study to the statewide network.

Group Work Sessions

Many instructors include times of activity as well as listening and discussion in ETN programs. An agricultural engineer who frequently works with 4-H woodworking leaders via ETN does just that when he presents technical material. In a wood identification program, for example, the first half of the program laid the basic background information to the topic; the second half was devoted to actual wood identification by participants at each ETN site around the state.

A wood identification key and wood samples were sent to each site. The program instructor would work with the ETN group by saying, "Okay, pick up piece of wood marked number 1. Note let's look at it and tie it into the key. Does it have this characteristic, does it have that characteristic?" After working down the key for practice, he'd ask ETN students to take one second sample and trace it down the key, and come on the network when a group felt they had identified it.

Brainstorming

Brainstorming is a simple concept for getting the most creative energy out of a group discussion by collecting a large number of ideas. Statewide committee meetings often follow this format on ETN. Network brainstorming sessions have ranged from collecting ideas about Wisconsin heritage programs to ideas for a weekend conference for forest owners.

After the program rules are explained, ETN moderators simply open up the network for ideas. The quantity of ideas is more important here than the quality. Freewheeling is invited. Editing and synthesis can always be accomplished after the ETN session. Follow-up ETN sessions are sometimes scheduled to appraise and further evaluate edited ideas.

Pre-ETN Warmup Sessions/Post ETN Sessions

A method used successfully by several ETN clientele groups is a warmup session prior to the actual ETN program. Groups at each site meet an hour before the ETN time to work on group projects, case studies, discuss outside reading material, and so on in small face-to-face situations. Often students find this pre-session to be valuable warmup for getting into the program topic. Then, when it's time for the ETN program to begin, students are eager to share their ideas, thought and comments with other statewide participants and the instructor.

On site discussion is also frequently scheduled for the hour following the ETN session.

The ETN medium is only a means to an end, but it will dictate certain possibilities and impossibilities. The initial psychological barriers to teaching via a telephone system will probably be more difficult for instructors to overcome than the real ones. Once these limitations are understood and accepted, however, the many capabilities and potentials of the system will be more apparent.

EVALUATION PROCESS FOR EDUCATIONAL TELEPHONE NETWORK PROGRAMS

To determine if appropriate education techniques were designed into E N programs, an evaluation system called the Program Evaluation Checklist (PEC) was developed. Its purpose is to study the relationship between the telephone system of communications and a program educational objectives, and also the tailoring of educational materials for transmission through a system like ETN.

Content specialists and communication educational specialists developed PEC based on variables common to the concerns, interests and objectives of both disciplines. The PEC consists of a list of statements which defines specific aspects of program content, organization, methods of presentation, materials, lecturer matters and physical facilities. All students in each ETN class that is evaluated are asked to rate each statement and determine how well it describes the program. For example, in evaluating the program lecturer, one question asks, "The program lecturer/moderator encouraged participants to take an active part in the program." Ratings are made on a numerical scale of 0 to 9. Demographic questions are also included in evaluations to obtain profiles of ETN students.

At the completion of the evaluation process for selected ETN programs, an extensive report is completed and is reviewed with individual instructors. Evaluation materials are strictly confidential between the Instructional Communications Systems staff and the instructor. The paramount purpose of this evaluation process is to determine program strengths and weaknesses and to assist and enhance the selection and utilization of appropriate education techniques for future ETN programs.

SUMMARY

For the most part, the use of the telephone for education has been virtually overlooked for the more glamourous media. It remains an untapped natural resource for education.

Wisconsin's Educational Telephone Network (ETN) developed out of a need to provide continuing education to medical doctors throughout the state. In 1974, well over 25,000 students enrolled in courses taught by the medium at a yearly cost well below that of conventional classes.

The development of the new Darome Edu-Com ETN station equipment has added to the technology of effectively using a telephone system for delivering educational experiences to a statewide audience.

The research on the tele-lecture systems and the use of telephone in education indicate that the telephone is a highly effective technique in communicating educational materials to students in widely dispersed geographical areas. Also research indicates that there has been no significant difference between the performance of students with the presence or absence of an instructor from the classroom in teaching via the telephone system.

Although there have been some technical problems with tele-lecture systems, the largest challenge is related to the development of quality programs. Techniques are offered to personalize this kind of learning environment for students to enhance two-way discussion and to incorporate a variety of formats into the course design.

In order to evaluate the effectiveness of the program design and educational techniques used on the telephone system, a program evaluation checklist (PEC) was developed at the University of Wisconsin to measure the effectiveness of programs offered on telephone systems.

CONCLUSIONS

In a historical perspective, Wisconsin's Educational Telephone Network is a new medium for instruction. It is a unique statewide delivery system and one that's proven to be an effective communications channel.

Access to this delivery system, however, is not enough. Its instructors must know how to use it effectively for it is both similar to and different from other media.

In Wisconsin, ETN has a significant following among faculty and students in every corner of the state. Its popular acceptance will continue to grow in the years to come through the work of professionals who both respect its limitations and exploit its power and its potentials.